

NANO BUBBLE TECHNOLOGIES

PORTABLE TESTING UNIT

WATER QUALITY TRANSFORMATION USING NANOBUBBLE INJECTION:
NBT1 SYSTEM EVALUATION

PORTABLE TESTING UNIT DETAILS

Tank Size: 1,000 litres

Unit Type: NBT 1-cell Injector



NBT PORTABLE TESTING UNIT PERFORMANCE

A single-injector NBT1 unit was installed within a mobile testing trailer designed to treat 1,000 litres of water on site. The system is capable of injecting both ozone and oxygen in nanobubble form, allowing for flexible, field-based demonstrations and data collection across a variety of water sources.

This mobile unit has been utilised extensively to conduct field trials, showcase operational performance, and develop a comprehensive database of pre- and post-treatment water quality results.



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WATER QUALITY TRANSFORMATION USING NANOBUBBLE INJECTION: NBT1 SYSTEM EVALUATION

OBSERVED OUTCOMES

The water quality testing yielded both anticipated and unexpected results, all of which underscore the efficacy of nanobubble technology for irrigation and turf management, especially in scenarios involving recycled effluent or bore water.

EXPECTED RESULTS

Dissolved Oxygen (DO): A **1033% increase** in dissolved oxygen levels following nanobubble treatment.

Microbial Reduction: A **93% reduction** in E. coli and faecal coliform bacteria, indicating significant disinfection performance.

UNEXPECTED BUT NOTABLE RESULTS

Bicarbonates: **10% reduction**, supporting improved soil infiltration and reduced chemical scaling potential.

Total Alkalinity: **13% reduction**, contributing to more stable irrigation water chemistry.

pH Level: **0.4 unit reduction**, aligning treated water closer to ideal agronomic pH ranges.

Biological Oxygen Demand (BOD): **10% reduction**, suggesting improved water quality and reduced organic loading.

Chlorides: **2% reduction**, particularly relevant for managing salt-sensitive turf species.

MECHANISM OF ACTION

Effluent and bore water sources are often characterised by elevated levels of bicarbonates, chlorides, and high pH, which pose challenges for effective turf irrigation. The nanobubble system addresses these challenges through oxidation, pH modulation & micro-cavitation.

Specifically, ozone (O_3)—a powerful oxidising agent—reacts with bicarbonate ions (HCO_3^-) to produce carbon dioxide (CO_2), hydroxyl ions, and water. As nanobubbles dissolve, the released CO_2 forms carbonic acid (H_2CO_3), which naturally lowers the water's pH, shifting the equilibrium and promoting further breakdown of bicarbonates.

This bicarbonate reduction and pH correction reduces the need for additional chemical treatment and enhances overall water quality, particularly in systems reliant on effluent or marginal water sources.

Visible changes pre and post treatment



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